

Summary

Essays on Education, Gender Equality, Fertility and Child Labor

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This dissertation consists of three essays on the interaction of education, gender equality, fertility rate and child labor. The first essay makes a thorough documentation of facts and empirically verifies the robustness of the relationship between fertility and gender equality in education. The second essay develops a mechanism to explain the correlation between our two variables of interest: fertility and gender equality in education. The last essay theoretically examines child labor restriction policy outcomes, mainly gender equality in education, in an environment where societal gender role is a key driver of household division of labor.

The last five decades have witnessed contrasting developments in education and birth rate: a significant rise in both overall average schooling and female to male education ratio in one hand and a drastic fall in the number of children per woman on the other. Following this development, many studies have endeavored to explain the association between education and fertility. One major framework of analysis in this regard is the child quantity and child quality(education) tradeoff approach pioneered by Becker (1960) and enriched in Becker & Lewis (1973). Subsequently, many researchers adopted this approach to analyze various dimensions of the nexus between fertility and education. However, although there is vast literature related to the investigation of child quantity– quality tradeoff, empirical work using cross–country data with emphasis on gender gap in education is rare. Most of the existing empirical studies in this area are micro–level experimental or quasi experimental ones. Even those studies that use cross– country fertility and education data either focus on general education or female education with less emphasis on gender disparity in education and its association with fertility. Moreover, their results on the relationship between fertility and education are mixed. Against this backdrop, in the third chapter, we verify the robustness of the correlation between fertility and female to male mean years of schooling ratio¹.

A cross– country comparison of fertility and gender gap in education shows that countries with lower female to male mean years of schooling ratio have significantly

¹The first and the second chapters provide the introduction and related literature review respectively.

higher fertility and the vice-versa. For example, in 1980, countries whose female to male mean years of schooling ratio is at the bottom 10% of the distribution of 109 countries in the data do have an average fertility of 6.79. On the contrary, those countries at the top 10% of the same distribution do have about 3.71 children per woman. Does this merely observed negative association between gender equality in education and fertility withstand empirical verification? Given this motivating fact, the purpose of the third chapter is to thoroughly document and empirically verify this correlation by employing longitudinal data with large cross-section of countries and latest education data. Using total fertility data from World Bank (2019) and education from Barro & Lee (2013), the first task in this chapter is to make a thorough documentation of the correlation of fertility and gender gap in education by taking into account income level differences and also variations in average years of schooling levels. The consideration of the latter two variables is crucial as they can affect both fertility and the gender gap in education. Second, and more importantly, we specify an empirical model to verify the degree of robustness of the merely observed relationship between the two variables of interest, fertility and gender gap in education. In our estimation, we account for confounding factors including income level, overall average level of education and also control for fixed effects. The results from our estimation show a robust negative association between fertility and female to male mean years of schooling ratio. This result is robust to various specifications².

What explains the correlation between gender disparity in education and fertility? The fourth chapter designs a mechanism to explain the link between fertility and gender gap in education. Here, we employ an altruistic overlapping generations model with parental gender preference bias in education investment and gender differential in the rate of returns to schooling as key components. This chapter extends the models used in De La Croix & Doepke (2003) where they investigate the link between initial human capital distribution and fertility differential using an altruistic model and Doepke & Tertilt (2016) in which they discuss son preference in bequests as a factor affecting growth with exogenous fertility. But unlike in these two papers, in this study the agents are heterogeneous gender wise –departure from the former. Fertility is endogenous—departure from the latter. In the current model, child education and fertility are endogenous and the agents care both about the quantity and quality of their children. The quality depends partly on the current education expenditure by parents and partly by other factors beyond the control of the household including gender specific returns to schooling. Thus, if parents attach high(low) preference to the quality of girls compared to boys, they will invest more(less) on their education. If they prefer high quality children irrespective of gender, per child education expenditure rises leading to a reduced fertility.

The results from the model show how high parental gender preference bias in education leads to an increase in fertility, depresses education levels and widens the gender

²We run both linear and log-linear models.

gap in education. Similar outcomes occur when gender differential in returns closes due to an increase in females' return to schooling. The quantity– quality tradeoff triggered by parental gender preference bias is an important explanation for this relationship in the model. Given these results, in the second part of this chapter, we perform a quantitative exercise by pinning down the model parameters using moments from two economies: Benin and Pakistan. We conduct a counter– factual experiment using the benchmark economies of the two– countries. Two exercises are conducted. First, we remove the disparity in the parental preference for quality between girls and boys that exists in the baseline economy by increasing the weight to the quality of the former to that of the latter while keeping other parameters fixed. Second, we remove the disparity in the return to education between girls and boys that exists in the benchmark by increasing the level of returns to the schooling of girls to the level of that of boys while keeping other parameters fixed. The result from the experiment shows that a decline in the preference bias of parents against a girl's education or increase in girls' returns to schooling reduces fertility and narrows the gender gap in education which corroborates the role of parental gender preference bias in education investment as implied by the model. Using a related framework, the final chapter investigates the interaction of gender equality in education, fertility and child labor.

Child labor practices or lack thereof have important implications for fertility and education. Doepke (2004) points out that child labor restriction policies affect the opportunity cost of education which has an effect on fertility. He finds that child labor ban reduces the opportunity cost of education– thereby boosts education and reduces fertility which is in line with the child quantity– quality tradeoff. And these outcomes of the policy in turn are found to have a positive effect on growth in GDP per capita due to the associated increase in skilled proportion of labor in an economy. However, in this and other similar studies, children are treated as monolith in terms of gender which may lead to the overlooking of some important aspects of child labor such as gender–based division of labor³. What will happen to the above results in Doepke (2004) if we consider gender role? The last chapter of the dissertation is devoted to addressing this question.

The final chapter theoretically investigates the potential consequences of child labor bans on the education of girls and boys in an environment where gender norms are key in governing the division of household labor. Using an altruistic overlapping generations model with child labor following an existing study but by adding two new features: gender heterogeneity and a home production sector undertaken by female members of the household, we examine how a child labor restriction policy affects mainly gender gap in education. Since child labor bans do not take into account unpaid domestic child work, there arises a potential for an unequal impact of such a policy on girls who are

³The overlooking of domestic child work in child labor measurements and the disproportionately high role girls play in this domain of work is noted by several studies including Basu & Tzannatos (2003).

more likely to engage in domestic production compared to boys who engage in child labor which takes place in non-domestic settings. The mechanism through which child labor restriction policies affect outcomes such as gender equality in education is through differences in the fall of the opportunity cost of education for boys and girls. The key factor contributing to this change in gender gap in education following a child labor ban is the gender-based division of household labor resulting in a female run home production sector. The home production time of girls in turn is a function of the share of girls in the production and the share of home produced consumption. The higher these shares, the more pronounced will be the change in gender equality in education—following a child labor ban.

When home production time of girls is high enough due to the relative share of home produced consumption and the role of girls in its production, the education of boys increases faster than that of girls as the former face relatively lower opportunity cost of education following a ban on child labor. Consistent with previous findings, in general, the results of the model show that child labor regulation increases education and reduces fertility. However, our results also show that there are cases in which gender gap in education widens following a child labor restriction policy despite both girls and boys experiencing a rise in their education levels. Our numerical exercise using a minimum working age requirement of 15 also shows that, given that the policy is non-binding for girls (home production is important to the household and girls are indispensable in this production due to gender norms) and binding for boys, the policy results in a reduced fertility and rise in the education levels of both genders. However, the education of boys increases by a larger proportion leading to a widening of the gender gap in education.

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